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Do Students Effectively Monitor Their Comprehension?

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ABSTRACT

This research is a preliminary investigation of students' awareness of their performance on comprehension tasks at reconstructive and constructive levels. After comprehension instruction, students were asked reconstructive and constructive level comprehension questions and asked to rate their performance on each level of questions. Students rated their performance higher than they actually performed on both levels of questions. They also rated their performance the same on the two levels of questions, although their performance on reconstructive questions was higher than on constructive questions. There was almost no relationship between students' actual performance and students' self-evaluation of performance on constructive level questions. Further research is needed to discover effective instructional techniques which develop more congruence between actual performance and self-awareness on both levels of questions.

Research indicates that successful readers are those who have higher ability to monitor their comprehension (August, Flavell, & Clift, 1984; Baker & Brown, 1984; Brown, Armbruster, & Baker, 1986; Garner, 1987; Paris, Lipson & Wixson, 1983; Paris & Meyers, 1981; Wagoner, 1983). Some researchers believe that effective readers must be aware whether or not comprehension is occurring, and consciously apply strategies (Baumann, Jones, and Seifert-Kessell, 1993). This process of

thinking about one's own learning and employing self-corrective strategies is metacognition, which is considered an important element of higher-order literacy.

At about the fourth grade level, instruction begins to focus increasingly on reading comprehension and reading materials become more complex and vary more in format (Chall, Jacobs, and Baldwin, 1990). Most teachers in the upper grades expect students to be able to read their texts without assistance, but are finding that students are not able to effectively read the texts nor monitor their comprehension. More information is needed to understand what we can expect of students in the upper grades in regard to metacognition, and how to facilitate instruction which promotes the development of these important processes.

Additionally, reading teachers and specialists are currently defining literacy as being able to reconstruct the author's intended meaning (factual/literal and inferential understanding), and to also construct their own meaning (applied and critical/creative understanding) from text (Manzo, Manzo, and McKenna, 1995). The push toward performance-based assessment in reading is a logical result of evidence that intrinsic motivation to continue learning to read has been found in the ability to construct one's own meaning from text, a higher-order literacy task.

Few dispute the need for teaching reconstructive and constructive levels of thinking and reading. However, assessment and instruction continue to emphasize reconstructive processes. This is probably due to the common belief that the basic skills must be developed prerequisite to the higher-level abilities. More probable, however, is the likelihood of the simultaneous development of reconstructive and constructive comprehension. Manzo and Manzo (1993) noted that "higher-order literacy does *not* appear to be simply an upward extension of reading comprehension" (p.429). In fact, higher-order literacy disorders are found in both remedial readers and proficient readers (Casale, 1982, Manzo & Manzo, 1990).

Ruddell (1990) discovered that students whose teachers asked more higher-order questions performed better on reconstructive

comprehension reading tasks as well as higher-level tasks. This supports the research of Cooter & Flynt (1986), who found that when students are asked only inferential questions (higher level than factual questions), they provided factual information in the process of answering the inferential questions, thus, there may be no need to even directly ask factual questions. They called this the Cognitive Caboose Theory, in which higher-order questions are the engine that pulls along the caboose (lower-level information).

Despite existing research pointing toward the need for a different type of instruction and assessment emphasizing higher-order literacy, information about students' performance on constructive level comprehension and implementation of measurement instruments which assess higher-order literacy skills is paradoxically lacking. Also, little is known about students' ability to monitor their comprehension at both reconstructive and constructive levels. This research was conducted as a preliminary investigation into (1) how effectively students monitor their comprehension at two levels of comprehension (reconstructive and constructive), and (2) the degree of relationship between students' actual performance and metacognitive awareness on reconstructive and constructive level questions.

Participants

The students in this study were selected because they had participated in a program called Project SUCCESS (Cooper, Boschken, Pistochini, & McWilliams; 1997), which emphasizes the role of metacognitive processes in the improvement of reading comprehension. Project SUCCESS is a program designed for upper elementary and middle grades and includes small-group, daily, fast-paced, literature-based instruction; reciprocal teaching; and response activities. The program introduces specific strategies for comprehension of text: summarizing, clarifying, questioning, and predicting. The strategies are taught through the reciprocal teaching approach, as developed by Palincsar and Brown (1984). In reciprocal teaching, the teacher teaches comprehension strategies within the lessons, and the teacher and students participate in modeling and practicing the strategies. Then the teacher gradually releases the responsibility of modeling and questioning to the

students, thereby teaching them metacognitive control (Duffy, Roehler, & Herrmann, 1988), or consciously directing their reasoning processes.

Project SUCCESS was implemented as a Title I reading intervention program for grades three through five. Children participated in grade level groups for daily, forty minute lessons. Although increasing metacognitive awareness was not the primary aim of implementing the program, this effect is possibly due to the program design. The lessons are structured and somewhat scripted, providing prompts for discussion, and examples for teacher modeling of mental processes. For example, in the third grade manual, the teacher is instructed to model the "clarify" strategy, and the exact words to say are provided: *"I can read the last word on page 23 by breaking it into the words over and joy and then adding the ending -ed. I get overjoyed, which must mean 'very joyful.'"* This emphasis on teacher modeling of effective comprehension strategies, with scaffolded instruction would seem to provide a basis for students to develop metacognitive awareness, or to think about how they are processing what they read. A possible weakness of the program, however, was that the metacognitive processes modeled were primarily at the reconstructive level. Students were asked higher-order thinking questions as after-reading response/reflection activities, but teachers did not model these answers.

Thirty students from each grade three, four, and five for a total of ninety were randomly selected from 307 Title I students. All participated in Project SUCCESS instruction for approximately 17 weeks. Thirty third-grade students, 28 fourth-grade students, and 29 fifth-grade students (Total=87) of those selected were available for testing.

Materials and Methods

After instruction, students were administered the Informal Reading-Thinking Inventory (IR-TI) (Manzo, Manzo, and McKenna, 1995) as a measure of reconstructive and constructive reading comprehension performance and metacognition. Informal reading inventories are generally administered to determine students' independent, instructional, and frustration reading levels in word recognition and comprehension at the reconstructive level. According to Burns' and Roe's (1993),

Informal Reading Inventory (IRI), the IRI contains six types of comprehension questions which address reconstructive level comprehension (p.4):

- (1) Main idea: asks for the central theme of the selection.
- (2) Detail: asks for bits of information directly stated in the material.
- (3) Inference: asks for information that is implied, but not directly stated, in the passage.
- (4) Sequence: requires knowledge of events in their order of occurrence.
- (5) Cause-and-effect: names a cause and asks for its effect, or mentions an effect and asks for its cause.
- (6) Vocabulary: asks for the meaning of a word or phrase used in the selection.

Manzo and Manzo (1993) noted that one of the “fundamental problems that stands in the way of launching a full scale effort to improve higher-order literacy...is a set of agreed upon measures to stimulate teacher explorations and attention to such needs “ (p.465). The IR-TI attempts to “assess the thinking, or meaning-making, aspects of reading that are emphasized in current views of the reading process” (p.iii). The IR-TI addresses not only reconstructive comprehension, but also constructive level comprehension. It was developed with the goal in mind to gather additional information about a student’s reading processes than a traditional IRI would provide. In addition to the information that can be gathered from an IRI, the IR-TI can produce the following pieces of information relevant to this research (Manzo, Manzo & McKenna, 1995, p.10):

1. Measurement of two dimensions of comprehension:
reconstructive (literal plus inferential comprehension)
constructive (critical and creative comprehension)

2. The extent of metacognition, as inferred from observations of self-monitoring and from quantitative counts of self-evaluations of accuracy in answering questions

The IR-TI is an individually administered test consisting of graded word lists and passages. For this research, students were only administered the passages portion of the IR-TI. Administrators began with the passage at the student's highest independent level on the IRI, as determined by the school district in their regular post-testing procedures for Title I services. For example, if a student read the 1st and 2nd grade passages of the IRI at his independent level, the administrator began the IR-TI with the 2nd grade passage.

Passages were read silently and comprehension questions were asked. The IR-TI has two types of comprehension questions for each passage: reconstructive and constructive. Students received separate scores calculated as percentages of questions correct for each type of question. For example, a student may answer 100% of the reconstructive questions correctly, but answer only 50% of the constructive questions correctly. The two resulting scores can be compared to see if differences exist between a student's reconstructive and constructive level comprehension.

Results and Discussion

Central to this study was the self-evaluative (metacognitive) subcategory of the IR-TI. After the reconstructive portion of the test, the student was asked to rate his performance on a scale of 1 to 5 (1-poorly, 2-not well, 3-half & half, 4-well, 5-very well) on those questions. After the constructive portion of the test, the student is asked to rate his performance on that section according to the same scale. This information can be compared with the student's actual performance on each level of questions, and a determination can be made as to the effectiveness of the student's self-monitoring processes. The actual performance was converted to a rating scale similar to the student self-rating scale as shown in Figure 1.

	Performance (% correct)	Performance Rating
Very Well	90-100	5
Well	80-89	4
Half & Half	70-79	3
Not Well	51-69	2
Poorly	50↓	1

Figure 1. IR-TI actual performance rating conversion chart.

Research Question #1: How effectively do students monitor their comprehension at reconstructive and constructive levels of comprehension?

At all three grade levels, means for self-evaluation of performance were much higher than for actual performance on both reconstructive and constructive level questions. Means for the IR-TI for each grade level are provided in Table 1. Self-evaluation of performance scores ranged from 3.4 to 4.0, whereas actual performance scores ranged from 1.1 to 2.7. If students perceive themselves as performing well when they have performed poorly, there may be no motivation to improve. Possible remedies for student performance over-rating are to receive systematic, appropriate, accurate, specific feedback from their teachers through systematic use of strategies such as reciprocal teaching, and to participate in self-evaluation activities which require the students to practice self-monitoring. More research needs to be conducted to determine if over-rating is a widespread occurrence, and if so, why students tend to over-rate their performance, and which types of instruction develop more congruence between actual performance and self-evaluation.

Table 1

IR-TI Means for 3rd Grade (N=30), 4th Grade (N=28), and 5th Grade (N=29)

	3 rd Mean	4 th Mean	5 th Mean
Reconstructive Actual Performance	2.5	2.2	2.7
Constructive Actual Performance	1.7	1.6	1.1
Reconstructive Self-evaluation of Performance	3.9	3.8	3.5
Constructive Self-evaluation of Performance	4.0	3.6	3.4

According to the means, students appear to rate their performance the same on reconstructive and constructive level questions, even though their actual performance on reconstructive questions was higher than on constructive questions. Table 1 outlines mean performances on each level of questions. Mean reconstructive actual performance was 2.5, whereas mean constructive actual performance was 1.7. Neither level fared well on the conversion chart (2.5 is between “Not Well” and “Half & Half”, and 1.7 is between “Poorly” and “Not Well”). The means for reconstructive and constructive self-evaluation of performance were 3.7 (between “Half & Half” and “Well”). Therefore, although they rated themselves as doing fairly well on both types of questions, their actual performance was not well.

Research Question #2: What is the degree of relationship between students' actual performance and self-evaluation of performance on reconstructive and constructive level questions?

IR-TI actual performance and self-evaluation of performance scores for reconstructive and constructive level questions were analyzed using a partial correlation controlling for grade level (See Table 2). The correlation between actual performance on reconstructive level questions and self-evaluation of performance on reconstructive level questions was positive ($r = .26$) and statistically significant at the .01 level. This

indicates that there was some (albeit low) congruence between students' actual performance and self-evaluations on reconstructive level questions. This could be because most reading instruction tends to emphasize this level of comprehension, and because Project SUCCESS specifically taught strategies and modeled mental processes for the reconstructive level. Perhaps students would benefit from a longer duration of metacognitive strategy instruction than the 17 weeks in this program, along with continued practice and application after the program.

The correlation between constructive level actual performance and constructive self-evaluation of performance was positive ($r = .05$) and was not statistically significant. There was almost no relationship between students' actual and perceived performance on constructive level questions, which seems to indicate that students are not aware of how well they are doing on these questions. This result may indicate a need for more instruction and feedback from teachers at the constructive level such as that suggested by Cooter and Flynt (1986) and Ruddell (1990). The Project SUCCESS instruction provided to the students in this study did not emphasize constructive level metacognitive processes.

The correlation between self-evaluation of performance on reconstructive level questions and self-evaluation of performance on constructive level questions was positive ($r = .37$) and was statistically significant at the .001 level. This low to moderate correlation between students' self-evaluation at the two levels of comprehension indicates students rate their performance similarly for the two types of questions. As indicated earlier, the means also indicate these similar ratings.

Why do students rate themselves similarly on both levels of questions when their performance varied so greatly? It is possible that the students do not make a distinction between the two levels of questions. If this is the case, a possible remedy for this situation is to directly teach students the different types of questions that can be asked and answered, and that some questions are either explicitly stated or implicitly suggested in the text and other questions require them to apply the information in the text to other situations. Direct teaching about various question types may develop the awareness in the students to

make the distinction and hence, assist them in rating themselves more accurately at each level.

Table 2

Correlational analysis for IR-TI actual performance and self-evaluation of performance on reconstructive and constructive level questions (N =87)

Variables	1	2	3	4
1. Reconstructive Actual Performance	1.00	.18	.26	.05
2. Constructive Actual lPerformance		1.00	.06	.05
3. Reconstructive Self-evaluation of Performance			1.00	.37
4. Constructive Self-evaluation of Performance				1.00

In summary, this research provides preliminary information into the investigation of an important aspect of literacy: metacognition. Students in this study had very little awareness of their comprehension performance on either reconstructive or constructive level questions. There was almost no relationship between students' actual performance and students' self-evaluation of performance on constructive level questions. Students yielded better self-awareness scores for reconstructive level comprehension than on constructive level comprehension, perhaps indicating that metacognitive awareness can be taught with programs such as Project SUCCESS, but with greater emphasis on teaching self-awareness at both levels of comprehension. Students may also benefit from more long-term instruction beyond the 17 weeks of Project SUCCESS. Further research is needed to determine why students tend to over-rate their performance, and to discover effective instructional techniques which develop more congruence between actual performance and self-evaluation of performance.

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